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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/723,655 11/28/00 HERMAN

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EXAMINER

BROCK II, P

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 06/01/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/723,655

Applicant(s)

HERMAN, THOMAS

Examiner

Paul E Brock II

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2000 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Drawings

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The term "about equal" in claim 9 is a relative term which renders the claim indefinite.

The term "about equal" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Using the term "about equal" in the phrase "a depth about equal to" does not provide a specific measure of how equal the depth has to be.

4. Claims 11 and 12 recites the limitation "second base diffusions" in the second line of each claim. There is insufficient antecedent basis for this limitation in the claim. For purposes of this office action the "second base diffusions" will be considered "source diffusions".

5. Claims 11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. Evidence that claims 11 and 12 fail(s) to correspond in scope with that which applicant(s) regard as the invention can be found in Paper No. 1 filed 11-28-00. In that paper, applicant has stated "More specifically, to form channel region 80, a boron implant is used at a dose of ... to a depth of about 1.25 microns." And further "The N⁺ source regions 81 are then formed using an arsenic implant at a

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dose of ... to a depth of about 0.4 microns and forming invertible channel regions 82 within bases 80.” and these statements indicates that the invention is different from what is defined in the claim(s) because it is assumed in claim 9 the “boron implant”, disclosed, is the “first base diffusion”, claimed, and the “arsenic implant”, disclosed, is used to form the “plurality of source diffusions”, claimed. Claims 11 and 12 depend from claim 9 and say the first base diffusions have a depth less than the second base diffusion. If this were the case invertible channel regions would not be formed.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 9 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kinzer (USPAT 5731604, Kinzer).

Kinzer discloses in figures 1 – 10 the process of manufacturing a MOS gated device.

Kinzer discloses in figure 1 forming a gate oxide layer (31) atop a silicon surface (30) of one conductivity type. Kinzer discloses in figure 1 forming a layer of polysilicon (32) atop the gate oxide layer. Kinzer discloses in figures 2 and 3 etching the polysilicon layer and the underlying gate oxide layer into a plurality of spaced stripes (33, 34 and 35) of oxide and polysilicon overlying the oxide. Kinzer discloses in figures 4 and 5 implanting and diffusing a

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plurality of spaced first base diffusion stripes (40 and 41) of the other conductivity type into the silicon surface, using the stripes of polysilicon as a mask. Kinzer discloses in figures 6 and 7 implanting and diffusing a plurality of source diffusions (51) in to the first base diffusion stripes, using the stripes of polysilicon as a mask, and leaving invertible channel regions along the outer edges of the first base diffusion stripes. Kinzer discloses in figures 6 and 7 diffusing third base diffusion stripes (50), into the silicon surface, using the stripes of polysilicon as a mask, to a depth about equal to that of the first diffusions and a width substantially equal to the space between the opposite edges of adjacent pairs of the polysilicon stripes.

With regard to claim 13, Kinzer discloses in figures 7 – 10 formation of insulation spacer layers (60) over the top and edges of the polysilicon stripes and the etching of shallow openings through central portions of the source regions and into the first base diffusions (80 and 81) and thereafter depositing a metal layer (84) over the upper surface of the device to contact the source regions and the first and second base diffusions.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 10 – 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinzer.

With regard to claims 10 – 12, Kinzer discloses in column 4, lines 55 – 65 that the dimensions of the polysilicon stripes are about 5 – 10 microns. Kinzer does not disclose that the polysilicon stripes have a width of about 3.1 microns and a spacing of about 1.25 microns. Kinzer also does not disclose that the first base diffusions have a depth of about .4 microns and the second base diffusions have a depth of about 1.25 microns. It is well known in the art to vary dimensions of device features as a matter of design choice. It would have been obvious to one of ordinary skill in the art at the time of the present invention to vary the dimensions of the polysilicon stripes to have a width of about 3.1 microns and a spacing of about 1.25 microns, and depths of base diffusions to have a depth of about .4 microns and the second base diffusions have a depth of about 1.25 microns of Kinzer in order to change the characteristics of current flow through the channel region.

With regard to claim 14, Kinzer discloses in figures 7 – 10 formation of insulation spacer layers (60) over the top and edges of the polysilicon stripes and the etching of shallow openings through central portions of the source regions and into the first base diffusions (80 and 81) and thereafter depositing a metal layer (84) over the upper surface of the device to contact the source regions and the first and second base diffusions.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Calafut et al., Davies, Kinzer (USPAT 5795793), and Wagers et al. all disclose gate layers, three implants and etching into the first implant layer. Kimura discloses using a polysilicon layer as an implant mask.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E Brock II whose telephone number is (703)308-6236. The examiner can normally be reached on 8:30 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703)308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Paul E Brock II
May 30, 2001



EDDIE LEE
SUPERVISORY PATENT EXAMINER
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